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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/049,792	02/14/2002	Hironori Aoki	542-007-2	6079

4955 7590 03/11/2003

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EXAMINER

DUONG, THOI V

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 03/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/049,792

Applicant(s)

AOKI, HIRONORI

Examiner

Thoi V Duong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 November 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5,6,8-13 and 15-18 ~~is~~ are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5,6,8-13 and 15-18 ~~is~~ are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the Amendment, Paper No. 4, filed November 26, 2002.

Accordingly, claims 1-3, 5 and 8-10 were amended, and claims 4, 7, 14 and 19-21 were cancelled. Currently, claims 1-3, 5, 6, 8-13 and 15-18 are pending in this application.

Claim Objections

2. Claim 6 is objected to because of the following informalities: claim 6 should be dependent on claim 1 instead of claim 4 which was cancelled. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-3, 5, 6, 8-12 and 15-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Dohjo et al. (USPN 6,078,366).

As shown in Figs. 1, 5 and 13, Dohjo discloses an array substrate 100 comprising:

a display area (TFT region) in which pixel electrodes 131 are formed,

a scanning line 111 formed of a low resistivity metal (col. 7, lines 16-27), said scanning line being arranged between the pixel electrodes,

a signal line 110 formed of a high melting point metal such as Mo, Ta or its alloy (col. 7, lines 28-37), said signal line crossing over the scanning line interposing an insulating layer 115 therebetween,

a terminal 152 to which a scanning signal is applied, and

an extended scanning line 125a for connecting the scanning line with the terminal 152, said extended scanning line being formed only of the same conductive film as for said signal line 110,

wherein the extended scanning line is electrically connected to the scanning line through contact holes 153, 154 at the neighborhood of the display area and electrically connected to the terminal for the scanning signal through contact holes 155, 156 at the neighborhood of the terminal;

wherein the scanning line and the extended scanning line are electrically connected via a conductive film of the same layer 131 as that for the pixel electrode;

wherein liquid crystal is interposed between the array substrate and a counter substrate 200 having a common electrode 231 and a color filter 221;

wherein the extended scanning line 125a is formed in a grid like shape at a region in which the scanning line and the extended scanning line are overlapped within a connecting portion between the scanning line and the extended scanning line (see Fig. 13); and

where aluminum or aluminum alloy is used for material of the scanning line (col. 7, lines 16-27);

As shown in Figs. 28-31, the array substrate further comprises:

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an auxiliary capacitance line 113 arranged in parallel to the scanning line,
a collected auxiliary capacitance line (dotted line of 190) arranged in parallel to the signal line and electrically connected to the auxiliary capacitance line 113,
a terminal to which a common signal is applied (at left of Fig. 28), and
an extended auxiliary capacitance line 125 for connecting the collected auxiliary capacitance line with the terminal for the common signal, said extended auxiliary capacitance line being formed only of the same conductive film as for said signal line (col. 23, lines 54-64),

wherein the auxiliary capacitance line, the collected auxiliary capacitance line and the scanning line are formed from the conductive film of same layer;

wherein the collected auxiliary capacitance line and the extended scanning line are crossing interposing an insulating layer 117 therebetween;

wherein the collected auxiliary capacitance line and the extended auxiliary capacitance line are electrically connected via a conductive film 193 of the same layer as that for the pixel electrode;

wherein the extended auxiliary capacitance line is electrically connected to the collected auxiliary capacitance line at the neighborhood of the display area through a contact hole 192 and electrically connected to the terminal for the common signal through a contact hole 194 at the neighborhood of the terminal; and

wherein the extended auxiliary capacitance line is formed in a grid or ladder like shape at a region in which the collected auxiliary capacitance line and the extended auxiliary capacitance line are overlapped within a connecting portion between the

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collected auxiliary capacitance line and the extended auxiliary capacitance line (see Fig. 31).

Dohjo also discloses in another embodiment that the extended scanning line and the pixel electrodes are formed from the conductive film of same layer (col. 5, lines 27-45). Since the extended auxiliary capacitance line is formed at the same layer as the extended scanning line, the extended auxiliary capacitance line and the pixel electrodes are formed from the conductive film of same layer.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dohjo in view of Sakata et al. (JP 11-284195) for the same reasons set forth in the last office action.

Response to Arguments

7. Applicant's arguments filed on November 26, 2002 have been fully considered but they are not persuasive.

Applicant argued that Dohjo does not appreciate the nature of the contact resistance problem and does not suggest combination with any disclosure to solve the (essentially metallurgical) problem. The Examiner disagrees with the Applicant's remarks since Dohjo discloses an array substrate comprising an extended scanning line

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125a and an extended auxiliary capacitance line 125 formed of the same conductive film as for the signal line 110 (high melting point metal such as Mo, Ta or its alloy, col. 7, lines 28-37), as shown in Figs. 1, 5, 10-13 and 31 (col. 9, line 66 through col. 10, line 2 and col. 23, line 61-64). In addition, the conductive layer 111a formed of low resistivity metal (Al) in Fig. 7 is a part of the scanning line 111, where the extended scanning line 125a is connected to. Thus, Dohjo really appreciates the nature of the contact resistance problem by suggesting a high melting point metal for the extended scanning line and the extended auxiliary scanning line. Finally, with respect to claim 13, the Sakata's reference is employed for teaching a process in which impurity constituted of one of N, O, Si and C is added to an upper layer of a scanning line formed of pure aluminum or aluminum alloy to directly provide low contact resistance (paragraph 11). Accordingly, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the array substrate of Dohjo with the teaching of Sakata by using partly or wholly nitridated aluminum or partly or wholly nitridated aluminum alloy for the scanning lines so as to obtain a good contact resistance.

Conclusion

8. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thoi V. Duong whose telephone number is (703) 308-3171. The examiner can normally be reached on Monday-Friday from 8:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached at (703) 305-3492.

Thoi Duong



02/28/2003



TOANTON
PRIMARY EXAMINER